Ohio Agricultural Research and Development Center
College of Food, Agricultural, and Environmental Sciences

OARDC Research Enhancement Competitive Grants Program

SEEDS

Seeds 27

Effects of Soy on Prostate Cell Growth

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Prostate cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths in men in the United States. Epidemiological evidence indicates that the incidence and mortality of prostate cancer are considerably lower in Asian populations compared to Western societies. However, the incidence of pre-cancerous lesions is the same for both populations. These associations indicate that environmental and lifestyle factors, such as diet, may play an important role in developing prostate cancer.

A number of recent studies suggest that an increased consumption of soy and soy-based foods is associated with reduced risk of prostate cancer. However, the mechanisms by which these foods impact prostate cancer risk are unknown.

OBJECTIVES

The objective of this research was to determine the anticancer potential of genistein — a naturally occurring isoflavone found in soy — using a non-cancerous human prostate epithelial cell line. Specifically, the effects of genistein on cell proliferation and growth-factor signaling were examined.

Treatment of cells with low-concentrations of genistein increased the proliferation of non-cancerous prostate cells while higher concentrations of this compound reduced proliferation. These data are in agreement with others observing concentration-dependent effects of genistein on cellular growth. Further studies revealed that the effects of genistein on prostate cell growth are due, in part, to modulation of estrogen-dependent growth-factor signaling pathways.

ACHIEVEMENTS

Our data support previous studies suggesting that soy isoflavones, including genistein, may have both cancer-preventative and cancer-promoting properties. Determining the exact role of genistein in prostate cancer and elucidating the specific cellular and molecular mechanisms by which this isoflavone functions is a critical step toward understanding the potential benefits provided by dietary consumption of soy isoflavones.

THE FUTURE

Efforts from this RECGP Seed Grant resulted in additional funding from the U.S. Department of Agriculture ($1,275,000 over three years). Specifically, our laboratory, in collaboration with scientists, Extension specialists, and economists from the Departments of Human Nutrition; Agricultural, Environmental, and Development Economics; Horticulture and Crop Science; and the College of Medicine are examining the potential benefits of dietary consumption of soy isoflavones and tomatoes on prostate health.

Additional information regarding these collaborative research efforts can be found at: http://fst.osu.edu/ifafs/

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